SOFTWARE ARTS TECHNICAL NOTES, BY THE CREATORS OF VISICALC

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# SATN

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## ABOUT THIS ISSUE

In this issue we begin a series of articles by Craig Stinson about using the VisiCalc® program with various word processing programs. The series begins with *Using VisiCalc with Magic Window,* which centers on Magic Window, a word processing program for the Apple II. Even if you do not use Magic Window, we urge you to read Craig's article through. It contains background information about the VisiCalc program's /PF files that can be useful to you no matter what kind of word processing program you own. In forthcoming issues Craig will cover word processors for other personal computers on which the VisiCalc program runs.

When Stewart Alsop II was between positions as editor of *INC.* magazine and *ISO WORLD* he gave a lot of thought to the idea of starting his own magazine. *Analyzing a Startup Venture* grew out of that effort and shows some interesting things about the use of @SUM, one of the most widely used of the built-in functions of the VisiCalc program. There are also some interesting insights into mass market magazine publishing.

Books about using the VisiCalc program are appearing faster than we can publish reviews of them, but we'll eventually get to the bottom of the pile if we keep at it. To that end, we've gotten Barry Bayer to review Beil's *The VisiCalc Book.*

We continue our exploration of the VisiCalc Advanced Version program with a look at how to create User Defined formats.

Not only are there a lot of books being published about the VisiCalc program, but there are also numerous other ideas about how to use the program found in general magazines and in publications similar to SATN. *VisiCalc Related Publications* continues in this issue with an update on some of the pieces that have appeared in the last few months.

Finally, since more than 90% of the readers responding to our survey questionnaire were interested or very interested in learning about new products, we decided, subject to some stringent conditions, to offer our subscription list to a selected group of firms. However, before we do that we want to give you the opportunity to remove your name from the list, and so we have included a card with this issue. If you do not want your name to be included on the list, please fill out the card and drop it in the mail to us.

## USING VISICALC AND MAGIC WINDOW

*by Craig Stinson*

In the VisiCalc® program, /SS produces an unformatted list of commands by which VisiCalc can subsequently rebuild your model. This stream of commands is most commonly sent to disk, but it can also be sent to the printer or to the video screen. The /SS command list preserves your formulas, so you can continue to play "what if" the next time you load your model.

The /P command, in contrast, creates a formatted "dump" of a VisiCalc model. That means that when you use /P the program lines up all labels and values as they appear on your screen, with the same column width and display formats. Values appear as values; and the formulas from which they were derived are not part of the /P dump.

Usually, you employ /P to get a hard copy of your VisiCalc model. But there are times when it's handy to have a formatted dump of your model in a disk file. In this article we'll look at some of the applications of VisiCalc's print-to-file capability and discuss using these files in conjunction with Magic Window, a popular word processing program for the Apple II.

## KEY TO CONVENTIONS USED IN SATN

The VisiCalc® program is available on personal computers manufactured by Apple, Atari, Commodore, Hewlett-Packard, IBM, and Radio Shack. To reduce any confusion arising from the differences among the keyboards of those computer systems, SATN uses a standard symbol and name to represent certain commonly used keys.

The symbol ® and the word RETURN are used as synonyms for the keys known as ENTER, ENDLINE, and RETURN. The symbol ^ is used to represent an exponentiation operator.

To make VisiCalc documentation more readable, the program was designed so that the colon (:) has the same effect as RETURN in some commands, as when ending the > command or separating various elements of the replicate command.

In examples of what to type, type exactly what you see and press RETURN at the end of every line. Users of the HP-83/85 may find it necessary to add parentheses to some of the expressions included in the text. For example, 3+4*5 should be (3+4)*5 on an HP-83/85.

Throughout SATN, one typeface represents both VisiCalc input and output (what you should type and what you will see on the screen). The typeface looks like this:

```
This line is typeset in OCR-B.
So is this: +A1+B1*3.25
```

To allow you to type the formulas directly on a VisiCalc sheet, examples in SATN specify coordinates, like A1, rather than the names of the values they represent. When actually typing a formula, you can use the arrows to point rather than using the > command.

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First, some mechanical details. The files in question are called /PF files, because the command by which you create them is /PF for Print File. In earlier versions of the VisiCalc program (the DOS 3.2 version for the Apple II, for example), the command was /PD, for Print to Disk; so in some of the older literature about VisiCalc you may find reference to /PD files. The terms /PD and /PF are synonymous. In fact, you can still use the /PD command on the DOS 3.3 VisiCalc for the Apple II.

You create a /PF file in much the same manner as you send a model to the printer. The position of the cursor at the time you issue the /PF command marks the upper left corner of the rectangle to be saved. After you type /PF, the program prompts you for a file name. When you've typed your file name and hit return, VisiCalc goes to disk momentarily (among other reasons, to see if the disk is full or write-protected). On some systems, if you use a file name that is already in the disk catalog, you'll be asked to confirm your willingness to replace a pre-existing file.

The last thing you do before your file is put on the disk is specify the lower right corner of the rectangle you want to save. As with other VisiCalc commands you can either name the cell in question or simply move the cursor to it and hit return.

Certain versions of the VisiCalc program (the IBM Personal Computer or Radio Shack Model II and III versions, for example) add the extension .PRF to whatever name you specify for a /PF file. This is handy because it allows you to use the same names for a /PF file as for the /SS file from which it is derived, without duplicating the names in the disk directory. The automatic extension .PRF also allows you to scan through the disk directory at the time you supply your file name. That is, when VisiCalc prompts you to name your /PF file, you can lean on the right arrow key and the program will display all files on the disk that have extensions of .PRF.

Mechanics aside now, why would you want to create a /PF file? What good is one?

The primary use for /PF files is in conjunction with text processing programs. The /PF option is an interface between VisiCalc and other software designed specifically for the manipulation of text, much as the DIF format is an interface between VisiCalc and other kinds of number processing programs.

Ultimately, you'll want to print a /PF file. The /PF facility merely allows you to take advantage of certain editing and formatting capabilities that word processors typically possess, but that the VisiCalc program (because it provides so many other functions) does not offer. We'll list a few reasons why you might want to apply the services of a word processor to a VisiCalc model; you'll undoubtedly think of others.

Bear in mind that the /PF file (like a normal printout on a printer) is a one-way transaction. You may use a word processor to enhance or alter the final printed appearance of a VisiCalc model; but you can't subsequently draw the /PF file back into the VisiCalc program for further numeric massage.

If you want to print long headings that span several columns, and particularly if you want these labels to be centered within your page or to appear flush right, you'll probably find that easier to accomplish by means of a word processor. If the printed form of your model must have columns of varying width, one way to achieve that variation is by editing a /PF file in a word processor.

Another use for the facilities of a word processor is to issue local printer control codes; control codes that apply to part of a model but not all of it. The VisiCalc /P command allows you to send a setup string to your printer; this string may be a date or title for the printed document, or it may be a code that affects some aspect of the appearance of your document (it may, for example, cause the printer to go into its condensed mode), or it may do both. In any case, from within the VisiCalc program, the setup string is the only chance you have to talk directly to the printer. Many word processing programs, on the other hand, permit you to issue printer control codes within your document and then kill them later on, so that you can, for example, print column headings in boldface type and the numbers below at the regular weight.

If you're printing a long VisiCalc model, you might want to take advantage of the paging features of a word processing program. It's reasonably easy to tell where page breaks will occur in a VisiCalc model; most printers put sixty-six lines on a standard eleven-inch form, so you can figure on a new page every sixty-six rows. Repeating column headings on each new page is probably easier to accomplish through VisiCalc's replicate capability than by doing block moves within a word processor. But if you need automatic running heads or running feet, complete with automatically incrementing page numbers, or if you want your page headings to alternate flush left and right, these needs are best met by funneling your document through a /PF file into a word processor.

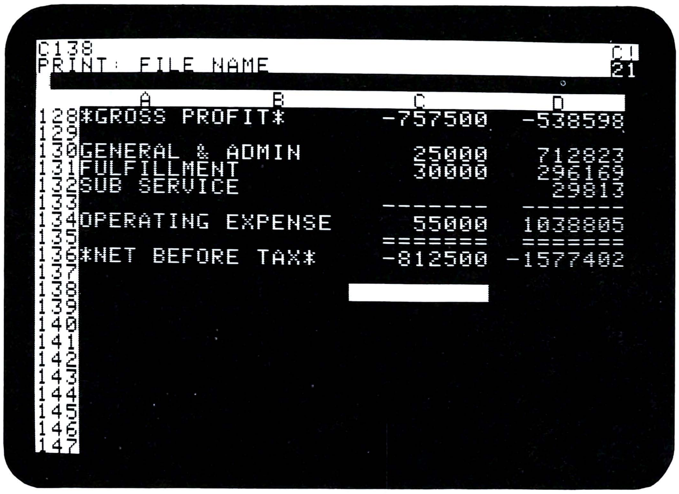
Probably the most common use for a /PF file is to incorporate a VisiCalc table or report into a larger document. You can print your model through VisiCalc's normal print procedure and simply insert it into your larger document, but if it doesn't merit a separate page, that's a little awkward. Most word processors provide for the incorporation of subfiles into larger files. Many programs also have conditional page breaking features that will, for example, prevent a page break from occurring within that portion of your document that you prepared with the VisiCalc program.

Now for some more mechanical details. Every word processing program obviously has its own command language and its own distinct features—not to mention its own idiosyncrasies about being on the receiving end of a VisiCalc /PF file transfer. We'll therefore look at only one program in the remainder of this article, and take up other word processing programs in followup articles.

Magic Window, by Artsci (North Hollywood, CA), is available exclusively on the Apple II (Plus or Standard). In what you might call its normal mode, it generates and prints binary text files. The VisiCalc /PF procedure on the Apple produces ASCII text files, so right away there's an apparent incompatibility between VisiCalc and Magic Window.

Fortunately, Magic Window also has a provision for reading and writing what it calls unformatted files. Don't be confused by the term. Unformatted to Magic Window simply means not formatted by Magic Window. Specifically, an unformatted file, to Magic Window's way of thinking, is an ASCII text file.

In order for a file to be recognized by Magic Window, it must end in .MW. When you create a file by means of Magic Window, the suffix is automatically given to your file name. If you want to load a /PF file, however, you'll need to put that extension on yourself. It's easy to do that from within the VisiCalc program. At the time you create your /PF file, simply add the suffix to the file name. If you have already left the VisiCalc program, though, you can rename the file through Apple DOS.



```
C138                                                    C!
PRINT: FILE NAME                                        21

               A          B            C          D
128*GROSS PROFIT*                -757500    -538598
129
130GENERAL & ADMIN                 25000     712823
131FULFILLMENT                     30000     296169
132SUB SERVICE                                29813
133                              -------    -------
134OPERATING EXPENSE               55000    1038805
135                              =======    =======
136*NET BEFORE TAX*              -812500   -1577402
137
138
139
140
141
142
143
144
145
146
147
```

**FIGURE 1.** *The VisiCalc /PF file used to illustrate this article is created from the analysis discussed in* Analyzing a Startup Venture. *Photograph by Dana Sigall*

To bring a /PF file into the Magic Window editor, you first select FILER SUBSYSTEM from the main menu. From the submenu that then appears, you select the option marked UNFORMATTED LOAD/SAVE. You'll then get a display that looks like this:

```
TRANSFER ENTIRE FILE .......... YES
RANGE MARKED .................. YES
INCLUDE ....................... YES
STARTING PARAGRAPH ............ 1
NUMBER OF PARAGRAPHS .......... 1

FILER SUBSYSTEM
CHANGE RANGE OPTIONS
SAVE FILE
LOAD FILE
INSERT FILE (AT CURSOR)
```

The FILER SUBSYSTEM line will be highlighted. As in VisiCalc, the highlight bar is your cursor, and also as in VisiCalc, you move the cursor by means of the right and left arrow keys.

To load a file, replace the Magic Window diskette with the data diskette containing your /PF file, move the cursor down to LOAD FILE, and hit return. Magic Window will read the disk catalog and display the names of all that it recognizes as "unformatted" files. Type in the name of the file you want, hit return, and in it comes. Your screen will go blank momentarily, then the UNFORMATTED LOAD/SAVE menu will appear.

In order to view the file that you have just loaded you will have to leave the UNFORMATTED LOAD/SAVE menu and enter the EDITOR. To do so, hit return three times. The first two returns will back you out to the main menu, the last takes you to the EDITOR. Your /PF file should be there, ready for use. You can leave the EDITOR temporarily by hitting shift-control-P, as you would when inserting a VisiCalc /PF file into another document (see below).

In the default scheme of things, Magic Window will load an entire disk file into memory. You can, however, arrange for it to bring in only part of a file. Here's how you do that.

From the UNFORMATTED LOAD/SAVE submenu (the one listed above), move your cursor to CHANGE RANGE OPTIONS and hit return. Your cursor will jump to TRANSFER ENTIRE FILE . . . . . . YES. Hit return here and YES will change to NO. At that point you may hit escape, which will return your cursor to the lower half of this menu. Move the cursor down to LOAD FILE, and hit return again. Now you'll be prompted not only for a file but also for range markers.

Magic Window will allow you to define the portion of a file you wish to load by specifying two character strings. The program will search through your file until it finds the first string, then it will load your file up to the point where it encounters the second string.

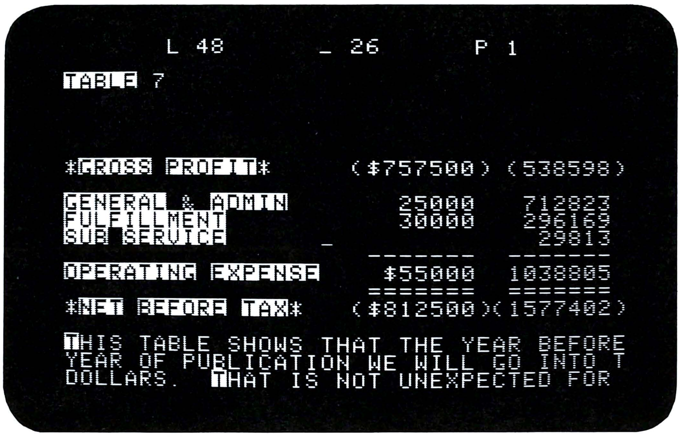
You have the option of including the start and finish strings within the file segment to be loaded or of leaving them out. The default condition is to include these markers. To override the default, select CHANGE RANGE OPTIONS (in the manner previously described), move your cursor to INCLUDE MARKERS and hit return. Once again, escape takes you back to the lower half of the submenu.

Note, by the way, that if the top line of the UNFORMATTED LOAD/SAVE submenu, the line that reads TRANSFER ENTIRE FILE . . . . , is in its default condition, that is, if it's set to YES, then it doesn't matter how the four lines directly below are set; the entire file will be loaded.

Magic Window will also let you incorporate a /PF file into another document. The way you do this is as follows. You must first have your "other document" loaded into Magic Window's editor. Put your cursor at the point in the other document where you want the /PF file to appear. Then leave the editor temporarily, by typing shift-control-P, and return by way of the filer subsystem to the UNFORMATTED LOAD/SAVE submenu. Then simply load your /PF file in by selecting the menu option INSERT FILE (AT CURSOR). When the light on your disk drive goes out, return to Magic Window's editor and your /PF file will be there at the cursor position.

The following features of Magic Window's editor will probably be of most concern to you.

There are no embedded commands. All formatting occurs on screen; what you see is what you'll get. Page breaks are indicated by dotted lines. Page lengths are selected from a separate format menu (outside of the editor) and default to 66 lines. So there isn't any automatic facility to ensure that your VisiCalc-produced file will not be printed with a page break in the middle of it. On the other hand, while you're in the editor you can see any awkward page breaks.



```
        L 48          _ 26          P 1
TABLE 7



*GROSS PROFIT*        ($757500) (538598)

GENERAL & ADMIN           25000    712823
FULFILLMENT               30000    296169
SUB SERVICE         _               29813
                       --------  --------
OPERATING EXPENSE        $55000   1038805
                       ========  ========
*NET BEFORE TAX*      ($812500)(1577402)

THIS TABLE SHOWS THAT THE YEAR BEFORE
YEAR OF PUBLICATION WE WILL GO INTO T
DOLLARS.  THAT IS NOT UNEXPECTED FOR
```

**FIGURE 2.** *After it has been loaded into Magic Window, the VisiCalc /PF file is available for further editing or the inclusion of additional files or text.*

*Photograph by Dana Sigall*

Control-Y will allow you to enter a page heading; putting a sharp sign (#) in the heading will generate automatic page numbers. The heading can only go at the top of the page, flush left, and there's no provision for local suppression of the page heading.

Another way you can talk directly to your printer from within your file is by starting your /PF file (while you're still in VisiCalc) with a setup string. Simply use whatever control codes you would use if you were printing directly from VisiCalc. The setup string can also be used to print a title for the /PF file; anything other than a control character entered into the setup string will simply appear at the beginning of your /PF file when you load it into Magic Window.

There are two size limitations that you need to know about when transferring files from VisiCalc to Magic Window. The first has to do with length, the second with width.

Because Magic Window doesn't allow you to append files at print time but instead requires you to merge elements into a single file, there's an upper limit on the size of the document you can manipulate directly. Fortunately, the program does use the extra memory provided by a 16K RAM card, if you have one.

The width limit is eighty columns. Magic Window doesn't allow for documents wider than eighty columns. And since what you see in the editor is exactly what you get at print time, it avails nothing to turn on the printer's condensed mode. You can only put eighty characters on a line in the editor, and you can only print what shows in the editor—and that's that. But since the /PF facility allows you to save any rectangle within a VisiCalc model, you can save wide models in two chunks, then incorporate them into Magic Window in an over-and-under fashion.

In the March/April issue of SATN, we'll take up using the VisiCalc program with WordStar.

*Craig Stinson is the editor of the magazine* Softalk for the IBM PC.

## BOOK REVIEW

Reviews published in SATN are the opinions of the reviewers, not of Software Arts, Inc. and may not be construed as official positions or endorsements by Software Arts, Inc.

### The VisiCalc Book, Apple Edition

Donald H. Beil, published by Reston Publishing Company, Inc. 301 Pages. $14.95. Versions for Atari and IBM PC are scheduled or currently available.

*Reviewed by Barry Bayer*

The first VisiCalc® books concentrated on a step by step run through some of the more abstruse VisiCalc commands, or consisted of instant templates, to be entered into the computer without much thought. In *The VisiCalc Book, Apple Edition,* Professor Beil attempts to address the new VisiCalc user, potential VisiCalc purchasers, data processing managers, experienced VisiCalc users, educators and trainers, and "managers, clients, and others who use results obtained from VisiCalc models or who work with models prepared by others . . ."

It is doubtful that Beil really hoped to be all things to all people, but *The VisiCalc Book* does provide a significant amount of worthwhile information for beginning students of VisiCalc and serves as a useful reference for advanced users. VisiCalc beginners will benefit by working through the command and built-in function references.

The book features excellent graphic representations that relate finished templates to specific types of screen displays (split screens, various column widths, titles, for example). It also devotes 23 pages to practice problems. As no solutions are given, I assume that the purpose of the practice problems is to demonstrate the many uses to which VisiCalc can be put. Chapters on documenting a VisiCalc template, communicating with the VisiCalc non-user ("What our Client, Secretary, or Supervisor Needs to Know: How Others Use Our Templates Successfully"), and a seven page bibliography of VisiCalc articles are included.

Some readers will undoubtedly find portions of the book overwritten, but the author's slow and careful style is useful in his discussion of the harder to use commands and built-in functions.

The chapter on "Recognizing, Preventing, and Correcting Errors" was disappointing, particularly as Beil demonstrated how to spot errors that VisiCalc would never permit (try entering the number "1" and the letter "O" immediately thereafter, for example), and the author's suggestions for detecting errors are either primitive or nonexistent. I find a standard printout, with columns and rows identified, and a line by line formula printout (available with a /SS,S[slot number] in VisiCalc for the Apple II) invaluable for debugging a template of any reasonable size. Surprisingly, although one of the practice problems Beil suggests is the construction of a template empty but for a border of consecutive numbers in Column A, and consecutive letters in Row 1, he does not suggest using the template as a debugging tool.

As an example of error checking, Beil shows a "check" column to test for entries exceeding a given numeric range, using the formula @MAX(HOURS – LIMIT,0) to return a "0" if the limit is not exceeded, and the amount of the excess, if the limit is exceeded, but complains that ". . . identifying possible errors is still heavily dependent upon the user of the system. Although this is ultimately true of most computer systems, other systems provide the capability for exception reporting, etc., which is not available with VisiCalc." Beil is not exactly wrong, but a bit of ingenuity, formatting the formula with /F*, would provide a very readable exception column, requiring the user to distinguish only between a blank cell and a string of asterisks.

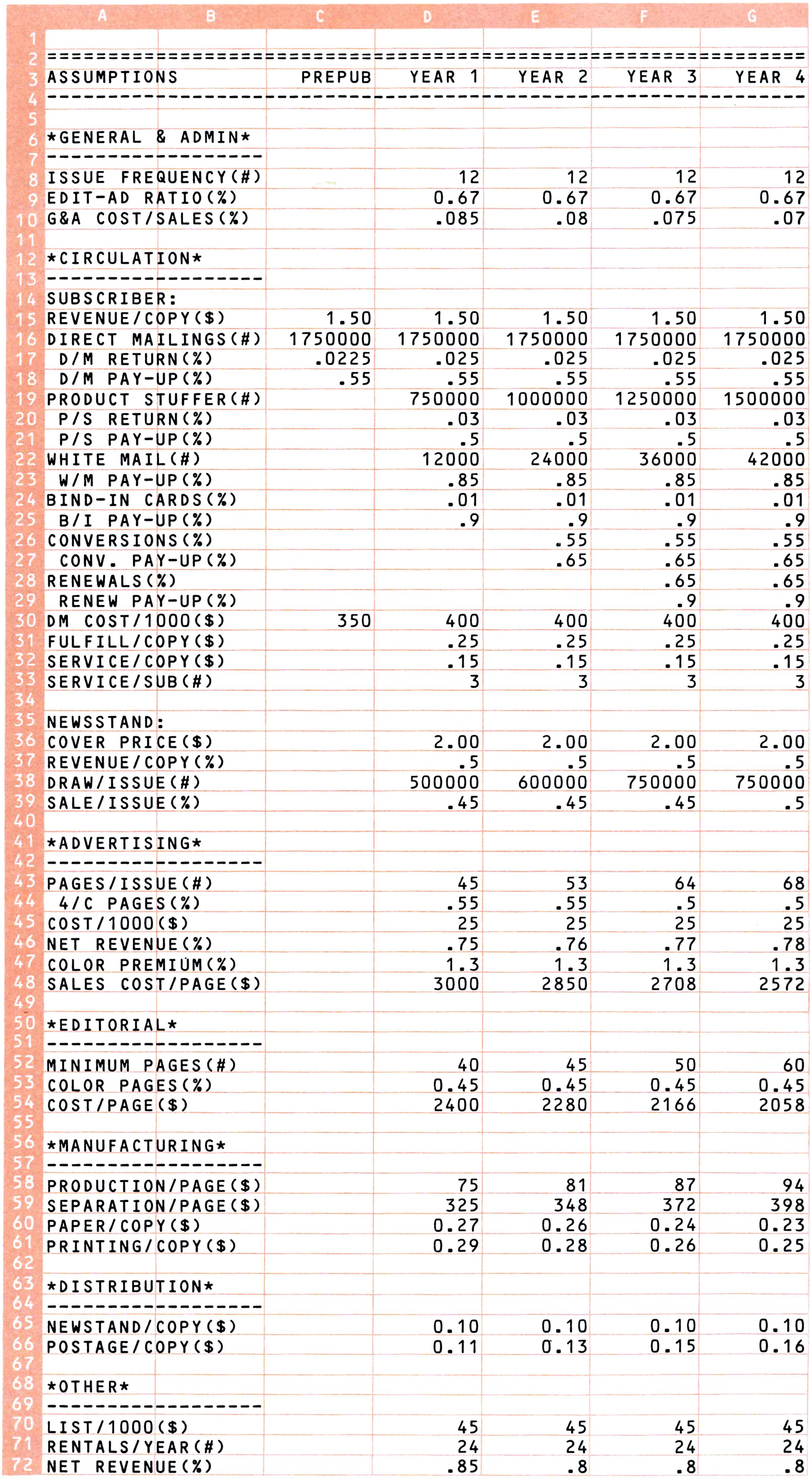
Further, many of Beil's sample templates minimize VisiCalc's "what if?" capability by including numbers as constants within a formula, rather than referencing other cells as variables. (Sometimes the author goes halfway. In one place, for example, personnel costs are computed as a fixed $20,000 and are then multiplied by a cell reference containing a variable number of employees.) Such designs aren't "wrong," but do represent missed opportunities to reinforce the concept of using cell references whenever possible.

The book's most glaring omission is a lack of discussion of the format for data interchange (DIF™) and the Exec functions possible by loading certain files which have been printed to disk using the /PF command. In fact, the author laments the lack of direct executive capability (using disk files to interact with a template), and is apparently unfamiliar with VersaCalc 16, as it is available for the Apple II, which thoroughly documents such capability. The author comes close, noting that certain commands "can be potentially helpful in creating input files, which are then loaded into memory by VisiCalc," but he once again fails to develop the topic.

As to the DIF format, Beil joins almost everyone else in assuming that files are used primarily (or even only) to transfer data between VisiCalc and other programs, or to "combine sheets, since more than one file can be loaded into memory" (at one time). But he does not point out or develop the idea of using the DIF format for "rolling" totals from one month to the next, for consolidating identically formatted departmental reports into a companywide report, for pulling the results of a series of "what if" calculations into a useable report, and numerous similar uses of the DIF format solely within VisiCalc.

*The VisiCalc Book,* though more informative than any other on VisiCalc I have read, is not the definitive VisiCalc book. It provides (mostly) sound advice for beginners and relatively new users, a detailed command and function reference section, and raises interesting questions about the use of VisiCalc in a business environment. But there is little real meat for a more experienced VisiCalc user. A SATN subscriber might want to give a copy to an employer or spouse for Christmas, but will probably not spend a great deal of time with it, except as a shelf reference.

*Barry Bayer is the author of "Visulating," a regular VisiCalc column appearing in* Desktop Computing.



| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | |
| 2 | ========== | ========== | ========== | ========== | ========== | ========== | ========== |
| 3 | ASSUMPTIONS | | PREPUB | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 |
| 4 | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- |
| 5 | | | | | | | |
| 6 | *GENERAL & ADMIN* | | | | | | |
| 7 | ------------------ | | | | | | |
| 8 | ISSUE FREQUENCY(#) | | | 12 | 12 | 12 | 12 |
| 9 | EDIT-AD RATIO(%) | | | 0.67 | 0.67 | 0.67 | 0.67 |
| 10 | G&A COST/SALES(%) | | | .085 | .08 | .075 | .07 |
| 11 | | | | | | | |
| 12 | *CIRCULATION* | | | | | | |
| 13 | ------------------ | | | | | | |
| 14 | SUBSCRIBER: | | | | | | |
| 15 | REVENUE/COPY($) | | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| 16 | DIRECT MAILINGS(#) | | 1750000 | 1750000 | 1750000 | 1750000 | 1750000 |
| 17 | D/M RETURN(%) | | .0225 | .025 | .025 | .025 | .025 |
| 18 | D/M PAY-UP(%) | | .55 | .55 | .55 | .55 | .55 |
| 19 | PRODUCT STUFFER(#) | | | 750000 | 1000000 | 1250000 | 1500000 |
| 20 | P/S RETURN(%) | | | .03 | .03 | .03 | .03 |
| 21 | P/S PAY-UP(%) | | | .5 | .5 | .5 | .5 |
| 22 | WHITE MAIL(#) | | | 12000 | 24000 | 36000 | 42000 |
| 23 | W/M PAY-UP(%) | | | .85 | .85 | .85 | .85 |
| 24 | BIND-IN CARDS(%) | | | .01 | .01 | .01 | .01 |
| 25 | B/I PAY-UP(%) | | | .9 | .9 | .9 | .9 |
| 26 | CONVERSIONS(%) | | | | .55 | .55 | .55 |
| 27 | CONV. PAY-UP(%) | | | | .65 | .65 | .65 |
| 28 | RENEWALS(%) | | | | | .65 | .65 |
| 29 | RENEW PAY-UP(%) | | | | | .9 | .9 |
| 30 | DM COST/1000($) | | 350 | 400 | 400 | 400 | 400 |
| 31 | FULFILL/COPY($) | | | .25 | .25 | .25 | .25 |
| 32 | SERVICE/COPY($) | | | .15 | .15 | .15 | .15 |
| 33 | SERVICE/SUB(#) | | | 3 | 3 | 3 | 3 |
| 34 | | | | | | | |
| 35 | NEWSSTAND: | | | | | | |
| 36 | COVER PRICE($) | | | 2.00 | 2.00 | 2.00 | 2.00 |
| 37 | REVENUE/COPY(%) | | | .5 | .5 | .5 | .5 |
| 38 | DRAW/ISSUE(#) | | | 500000 | 600000 | 750000 | 750000 |
| 39 | SALE/ISSUE(%) | | | .45 | .45 | .45 | .5 |
| 40 | | | | | | | |
| 41 | *ADVERTISING* | | | | | | |
| 42 | ------------------ | | | | | | |
| 43 | PAGES/ISSUE(#) | | | 45 | 53 | 64 | 68 |
| 44 | 4/C PAGES(%) | | | .55 | .55 | .5 | .5 |
| 45 | COST/1000($) | | | 25 | 25 | 25 | 25 |
| 46 | NET REVENUE(%) | | | .75 | .76 | .77 | .78 |
| 47 | COLOR PREMIUM(%) | | | 1.3 | 1.3 | 1.3 | 1.3 |
| 48 | SALES COST/PAGE($) | | | 3000 | 2850 | 2708 | 2572 |
| 49 | | | | | | | |
| 50 | *EDITORIAL* | | | | | | |
| 51 | ------------------ | | | | | | |
| 52 | MINIMUM PAGES(#) | | | 40 | 45 | 50 | 60 |
| 53 | COLOR PAGES(%) | | | 0.45 | 0.45 | 0.45 | 0.45 |
| 54 | COST/PAGE($) | | | 2400 | 2280 | 2166 | 2058 |
| 55 | | | | | | | |
| 56 | *MANUFACTURING* | | | | | | |
| 57 | ------------------ | | | | | | |
| 58 | PRODUCTION/PAGE($) | | | 75 | 81 | 87 | 94 |
| 59 | SEPARATION/PAGE($) | | | 325 | 348 | 372 | 398 |
| 60 | PAPER/COPY($) | | | 0.27 | 0.26 | 0.24 | 0.23 |
| 61 | PRINTING/COPY($) | | | 0.29 | 0.28 | 0.26 | 0.25 |
| 62 | | | | | | | |
| 63 | *DISTRIBUTION* | | | | | | |
| 64 | ------------------ | | | | | | |
| 65 | NEWSTAND/COPY($) | | | 0.10 | 0.10 | 0.10 | 0.10 |
| 66 | POSTAGE/COPY($) | | | 0.11 | 0.13 | 0.15 | 0.16 |
| 67 | | | | | | | |
| 68 | *OTHER* | | | | | | |
| 69 | ------------------ | | | | | | |
| 70 | LIST/1000($) | | | 45 | 45 | 45 | 45 |
| 71 | RENTALS/YEAR(#) | | | 24 | 24 | 24 | 24 |
| 72 | NET REVENUE(%) | | | .85 | .8 | .8 | .8 |

**FIGURE 3.** *This figure shows the Assumptions section of the sheet analyzing a startup venture.*

# ANALYZING A STARTUP VENTURE

*by Stewart Alsop II*

Anyone who has thought of starting a business knows how complicated it is to figure out whether their idea has a chance of making money. Assuming good management and a sound idea, the problem is less one of predicting precisely what may happen when the business opens its doors as it is of judging whether it is even possible to make money. The VisiCalc® program, however, allows a budding entrepreneur to get a quick fix on an idea's financial potential before getting into the complicated process of pinning down cash-flow projections, writing the business plan, and raising money.

The model described in this article was built to test the assumptions for a national, paid-circulation, consumer magazine. Magazines are complex ventures. A single product may have as many as four (or more) sources of income from several markets: subscribers, occasional readers, advertisers, and direct marketers. What's more, each time a new issue is scheduled, the product must be manufactured from scratch.

The model can be adapted to other new businesses or used to generate projections in established companies. Reproducing it exactly as shown will take from one to three hours, depending on how fast you type and how often you're interrupted. Once it's reproduced, and you've had time to play with the assumptions and see better how the model works, you can easily adapt it to your own uses.

There are three parts to the model, reflecting the three stages of launching a business: making assumptions about costs, pricing, and revenues; keeping track of operating figures once the business is established; and recording financial performance after the fact. Each part flows into the next through the expressions detailed below. None of the expressions contains references to coordinates below or to the right (a forward reference) so no recalculations are necessary after the sheet has been loaded into memory.

In this model columns A and B contain labels; column C is for a prepublication startup period (and should be deleted if using the model in an established business); and columns D through G for the four years of the projections.

Begin by setting up your sheet with:

```
/GRM
```

The first part of the model (lines 1 through 72, including column headings) contains no expressions, only labels and the numbers representing the entrepreneur's assumptions. The assumptions segment is illustrated in Figure 3 and should be entered exactly as shown, formatting locally as needed.

## Operating Statistics

The operating statistics segment turns the assumptions into figures that represent nonfinancial performance. Enter the labels shown in Figure 4. As you enter the expressions below, refer to Figure 3 to see which assumptions are being manipulated by each expression.

The first expression, on line 77, calculates the number of copies sold on newsstands by multiplying the draw per issue (copies placed on newsstands) times sale per issue (percentage of draw copies actually sold). Enter and replicate:

```
>D77:+D38*D39®/R:E77 . . . G77:RR
```

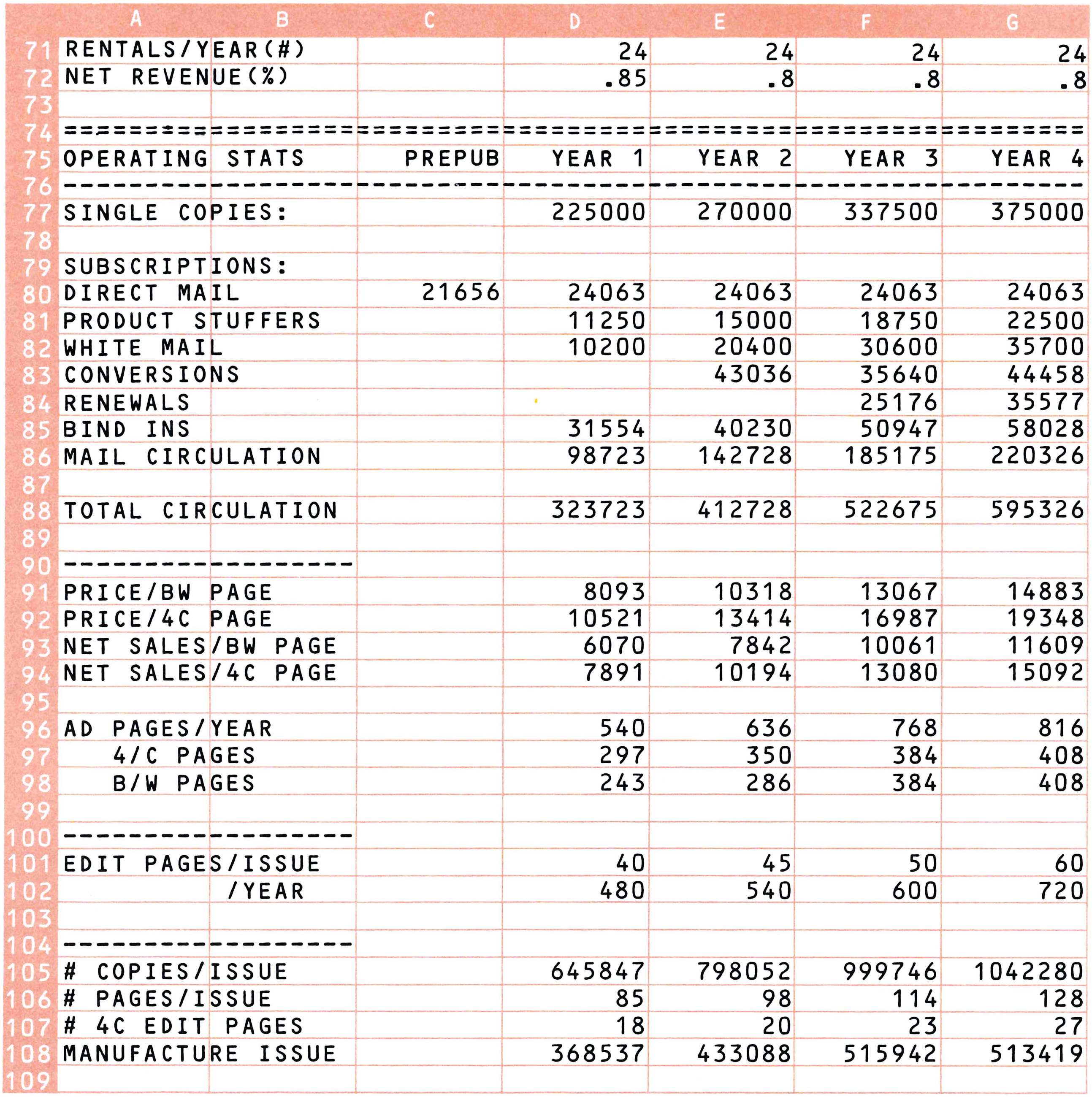
The next seven rows on the sheet deal with subscriptions gained from different mail sources. The expressions required are complex because different subscription sources (direct mail, product stuffers, unsolicited subscriptions, bind-in cards, conversions (first time renewals), and renewals) have different productivity levels that change over time. Some sources produce many subscriptions early, but tail off quickly. Other sources yield fewer subscriptions at first, but can be used effectively over and over again. Enter and replicate the following series of expressions:

```
>C80:+C16*C17*C18®/R:D80 . . . G80:RRR
>D81:+D19*D20*D21®/R:E81 . . . G81:RRR
>D82:+D22*D23®/R:E82 . . . G82:RR
>E83:@SUM(C80,D86)*E26*E27
>F83:@SUM(E80 . . . E82, E85)*F26*
      F27®/R:G83:RRRRR
>F84:+E83*F28*F29
>G84:(F83+F84)*G28*G29
>D85:+D8*D24*D25*@SUM(D77 . . . D84,C80)
>E85:+E8*E24*E25*@SUM(E77 . . .
      E84)®/R:F85 . . . G85:RRRRR
>D86:@SUM(C80,D80 . . . D85)
>E86:@SUM(E80 . . . E85)®/R:F86 . . .
      G86:RR
```

Once you've entered the expressions shown, recalculate the sheet. Since the expression at E83 referenced a value that you entered later, the value on your screen won't match the value in Figure 4 until you recalculate.

You now have a simplified model of the sources of a magazine's circulation. The model doesn't consider several subtleties that are crucial to actually planning the magazine's startup. For instance, direct mail subscriptions could well come from as many as 150 rented lists, which might have response rates (row 17) ranging from .75% to 4% and pay-up rates (line 18) ranging from 45% to 80%, some inversely and some conversely proportional to response rates. Before actually starting the magazine, the entrepreneur should write a month-by-month circulation model that predicts response, pay-up, conversion, and renewal by type of source and that converts that into cash flow.

This is a simplified model for quick tests, however, and it reveals a couple of "tricks" about the VisiCalc program. For instance, within the @SUM function, you can use a range as one of the items in the list (see expression at F83). The @SUM function of the program is one of its most widely used ones and does not necessarily have to be made up of either a pure list or a pure range. The expression at D105, for example, includes the term −(D80+D81). And the @SUM function can include other functions like @INT, @MIN, @AVERAGE and so on.



| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 71 | RENTALS/YEAR(#) | | | 24 | 24 | 24 | 24 |
| 72 | NET REVENUE(%) | | | .85 | .8 | .8 | .8 |
| 73 | | | | | | | |
| 74 | ========= | ========= | ========= | ========= | ========= | ========= | ========= |
| 75 | OPERATING STATS | | PREPUB | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 |
| 76 | --------- | --------- | --------- | --------- | --------- | --------- | --------- |
| 77 | SINGLE COPIES: | | | 225000 | 270000 | 337500 | 375000 |
| 78 | | | | | | | |
| 79 | SUBSCRIPTIONS: | | | | | | |
| 80 | DIRECT MAIL | | 21656 | 24063 | 24063 | 24063 | 24063 |
| 81 | PRODUCT STUFFERS | | | 11250 | 15000 | 18750 | 22500 |
| 82 | WHITE MAIL | | | 10200 | 20400 | 30600 | 35700 |
| 83 | CONVERSIONS | | | | 43036 | 35640 | 44458 |
| 84 | RENEWALS | | | | | 25176 | 35577 |
| 85 | BIND INS | | | 31554 | 40230 | 50947 | 58028 |
| 86 | MAIL CIRCULATION | | | 98723 | 142728 | 185175 | 220326 |
| 87 | | | | | | | |
| 88 | TOTAL CIRCULATION | | | 323723 | 412728 | 522675 | 595326 |
| 89 | | | | | | | |
| 90 | --------- | --------- | | | | | |
| 91 | PRICE/BW PAGE | | | 8093 | 10318 | 13067 | 14883 |
| 92 | PRICE/4C PAGE | | | 10521 | 13414 | 16987 | 19348 |
| 93 | NET SALES/BW PAGE | | | 6070 | 7842 | 10061 | 11609 |
| 94 | NET SALES/4C PAGE | | | 7891 | 10194 | 13080 | 15092 |
| 95 | | | | | | | |
| 96 | AD PAGES/YEAR | | | 540 | 636 | 768 | 816 |
| 97 | 4/C PAGES | | | 297 | 350 | 384 | 408 |
| 98 | B/W PAGES | | | 243 | 286 | 384 | 408 |
| 99 | | | | | | | |
| 100 | --------- | --------- | | | | | |
| 101 | EDIT PAGES/ISSUE | | | 40 | 45 | 50 | 60 |
| 102 | | /YEAR | | 480 | 540 | 600 | 720 |
| 103 | | | | | | | |
| 104 | --------- | --------- | | | | | |
| 105 | # COPIES/ISSUE | | | 645847 | 798052 | 999746 | 1042280 |
| 106 | # PAGES/ISSUE | | | 85 | 98 | 114 | 128 |
| 107 | # 4C EDIT PAGES | | | 18 | 20 | 23 | 27 |
| 108 | MANUFACTURE ISSUE | | | 368537 | 433088 | 515942 | 513419 |
| 109 | | | | | | | |

**FIGURE 4.** *In this figure the Operating Statistics are shown.*

To get total circulation, upon which advertising rates are based, newsstand and mail circulation must be added:

```
>D88:+D77+D86®/R:E88 . . . G88:RR
```

The next seven rows of the model calculate the operating statistics for the advertising department of the magazine, including basic price per page, net revenue per page, and number of pages per year.

```
>D91:+D45*(D88/1000)
>D92:+D91*D47
>D93:+D91*D46
>D94:+D92*D46
>D96:+D8*D43
>D97:+D44*D96
>D98:+D96-D97
>D91:/R . . . D98:E91 . . .
     G91:RRRRRRRRRRRRRR
```

These expressions contain one of the wonderful truths about the magazine business; growth necessarily brings more profitability. It works this way: as circulation increases, circulation revenue increases at the same rate as unit sales, but advertising revenue increases at a higher rate because larger circulation means you can charge more for each page. And, at the same time, unit costs of both circulation and advertising decrease, as greater volume brings greater efficiency, and renewing subscriptions and advertising contracts costs less than acquiring new ones.

Rows 101 and 102 calculate the operating guidelines for the editorial department, the number of pages per issue and per year. In this case, the editors have to deliver a minimum number of pages to the reader to make the subscription price worthwhile, which explains the @MAX function in line 101.

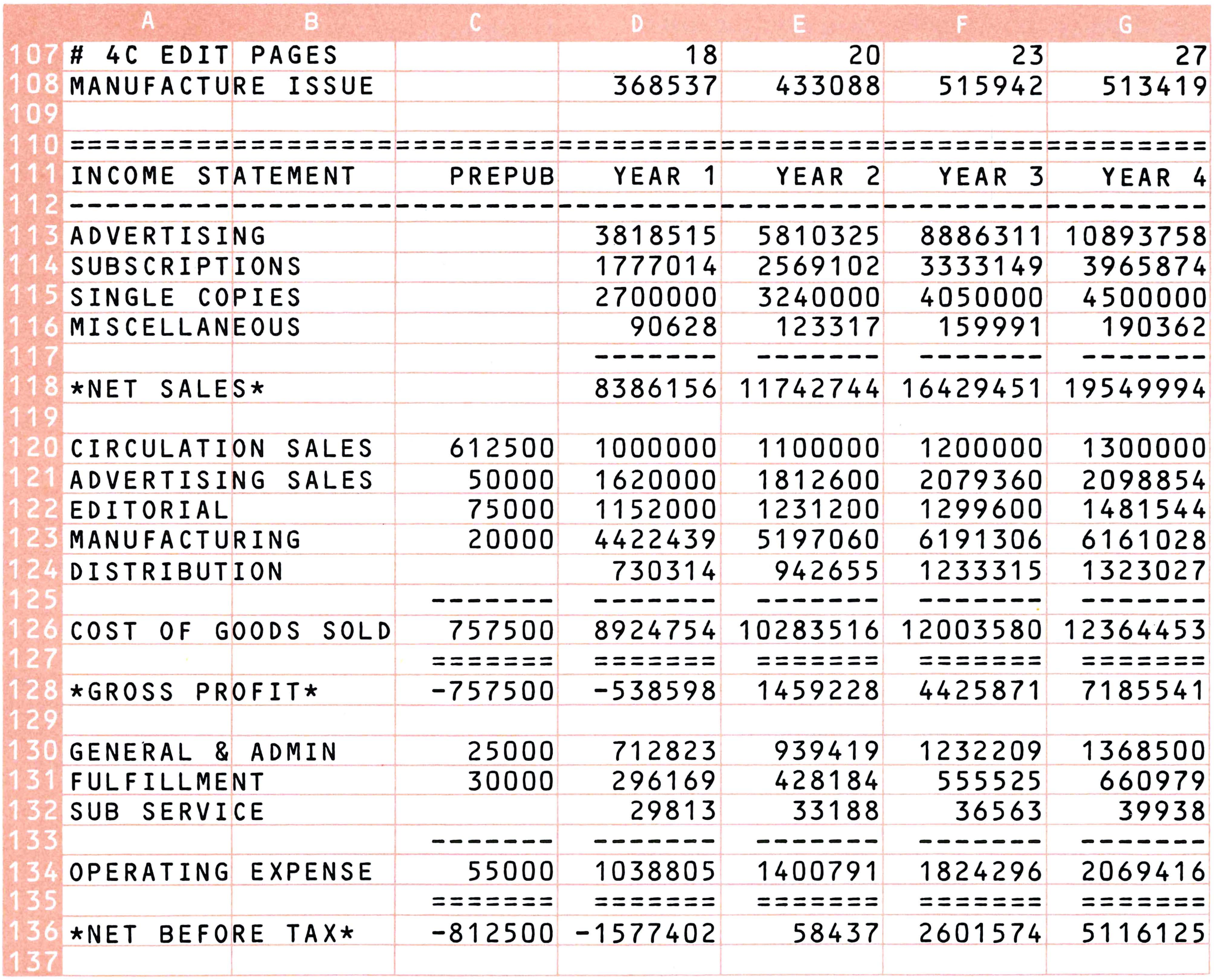
```
>D101:@MAX(D9*D43,D52)
>D102:+D8*D101
>D101/R . . . D102:E101 . . . G101:RRRRR
```

The next four rows calculate the critical manufacturing numbers. Again, this is a highly simplified model of manufacturing costs. Figuring out the number of copies to be printed (row 105) is much more complex than represented in this expression. Besides the copies needed for newsstand sale, subscribers, and office use, the publisher must also print magazines for people who have ordered subscriptions but haven't or won't pay for them.

```
>D105:@SUM(D38,D86,D16*D17,D19*D20,
        -(D80+D81),D88*.05)
>D106:+D43+D101
>D107:+D101*D53
>D108:@SUM(D58*D106,D59*(D107/D8),
        (D60+D61)*D105)
>D105:/R . . . D108:E105 . . .
        G105:RRRRRRRRRRRRRRRRRRRR
```

### Income Statement

Next, we take some of the cost and revenue assumptions and some of the operating statistics and mix them together into a simplified profit and loss statement. Note that this part of the sheet, shown in Figure 5, is not a cash-flow statement, which should be set up on a monthly basis and take into account the patterns of collecting and disbursing receivables and payables. The bottom line of a cash-flow statement



| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 107 | # 4C EDIT PAGES | | | 18 | 20 | 23 | 27 |
| 108 | MANUFACTURE ISSUE | | | 368537 | 433088 | 515942 | 513419 |
| 109 | | | | | | | |
| 110 | ================ | ========== | ========== | ========== | ========== | ========== | ========== |
| 111 | INCOME STATEMENT | | PREPUB | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 |
| 112 | ---------------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- |
| 113 | ADVERTISING | | | 3818515 | 5810325 | 8886311 | 10893758 |
| 114 | SUBSCRIPTIONS | | | 1777014 | 2569102 | 3333149 | 3965874 |
| 115 | SINGLE COPIES | | | 2700000 | 3240000 | 4050000 | 4500000 |
| 116 | MISCELLANEOUS | | | 90628 | 123317 | 159991 | 190362 |
| 117 | | | | ------- | ------- | ------- | ------- |
| 118 | *NET SALES* | | | 8386156 | 11742744 | 16429451 | 19549994 |
| 119 | | | | | | | |
| 120 | CIRCULATION SALES | | 612500 | 1000000 | 1100000 | 1200000 | 1300000 |
| 121 | ADVERTISING SALES | | 50000 | 1620000 | 1812600 | 2079360 | 2098854 |
| 122 | EDITORIAL | | 75000 | 1152000 | 1231200 | 1299600 | 1481544 |
| 123 | MANUFACTURING | | 20000 | 4422439 | 5197060 | 6191306 | 6161028 |
| 124 | DISTRIBUTION | | | 730314 | 942655 | 1233315 | 1323027 |
| 125 | | | ------- | ------- | ------- | ------- | ------- |
| 126 | COST OF GOODS SOLD | | 757500 | 8924754 | 10283516 | 12003580 | 12364453 |
| 127 | | | ======= | ======= | ======= | ======= | ======= |
| 128 | *GROSS PROFIT* | | -757500 | -538598 | 1459228 | 4425871 | 7185541 |
| 129 | | | | | | | |
| 130 | GENERAL & ADMIN | | 25000 | 712823 | 939419 | 1232209 | 1368500 |
| 131 | FULFILLMENT | | 30000 | 296169 | 428184 | 555525 | 660979 |
| 132 | SUB SERVICE | | | 29813 | 33188 | 36563 | 39938 |
| 133 | | | ------- | ------- | ------- | ------- | ------- |
| 134 | OPERATING EXPENSE | | 55000 | 1038805 | 1400791 | 1824296 | 2069416 |
| 135 | | | ======= | ======= | ======= | ======= | ======= |
| 136 | *NET BEFORE TAX* | | -812500 | -1577402 | 58437 | 2601574 | 5116125 |
| 137 | | | | | | | |

**FIGURE 5.** *The Income Statement section of the analysis, from which other financial reports are drawn.*

would probably look a lot different from the bottom line of this sheet.

The first section of the income statement calculates and totals net revenues from each of the four markets (subscribers, newsstands, advertisers, and list renters). Enter the labels shown in Figure 5 and then enter:

```
>D113:@SUM(D93*D98,D94*D97)
>D114:+D8*D15*D86
>D115:+D8*D36*D37*D77
>D116:+D70*D71*D72*D86/1000
>D117:/--
>D118:@SUM(D113 . . . D117)
```

Note that we have included the repeating label in the @SUM range, so we can expand this section as needed.

Now replicate those expressions into columns E through G. Enter:

```
>D113:/R . . . D118:E113 . . .
      G113:RRRRRRRRRRRRRRRR
```

The second section of the income statement calculates and totals the costs of operating each of five of the magazine's departments. In magazine publishing, these five departments are often considered the cost of the goods sold.

```
>C120:+C16/1000*C30
>D120:+D16+D19/1000*D30
>C121:50000
>D121:+D8*D43*D48
>C122:75000
>D122:+D54*D102
>C123:20000
>D123:+D8*D108
>D124:+D8*@SUM(D66*D86,D38*D65)
>C125:/-=
>D120:/R . . . D125:E120 . . .
      G120:RRRRRRRRRRRRRRR
>C126:@SUM(C120 . . . C125)®/R:D126 . . .
      G126:RR
```

Note that in the section for cost of goods sold and the following section, you have to supply dollar figures for the cost of operating the company before the magazine begins publication. On a magazine, there are prepublication costs for editorial, advertising, and general and administrative. Other businesses would be different.

On row 128 gross profit is calculated by subtracting the cost of goods sold from net revenues.

```
>C128:C118-C126®/R:D128 . . . G128:RR
```

Obviously, there are no net sales during the prepublication time, so our sheet shows a loss then, as well as a loss the first year of publication.

The last section of the income statement calculates and totals the operating expenses for the magazine and finally calculates the bottom line (literally and financially).

```
>C130:25000
>D130:+D10*D118
>C131:30000
>D131:+D8*D31*D86
>D132:+D32*D33*@SUM(D16*D17,D19*D20)
>D130:/R . . . D132:E130 . . .
      G130:RRRRRRRRRRR
>C133:/--®/R:D133 . . . G133
>C134:@SUM(C130 . . . C133)®/R:D134 . . .
      G134:RR
>C136:+C128-C134®/R:D137 . . . G137:RR
```

Now you have a quick, easy way to figure out the viability of an idea for a national, paid-circulation magazine.

Play around with the assumptions in this model for a while to see which ones really damage the bottom line and which ones barely touch it. For instance, a lot of publishing entrepreneurs think that the total number of advertising pages is really important to the success of the magazine. In reality, though, what's more important is the percentage of those pages that are full-color. Go to D44, change it to 0.75, replicate it across the row, and recalculate the sheet. You'll see how much more money you can make with the same number of ad pages, but more color.

You'll find that some of the key ratios are: editorial-advertising ratio (row 9); any of the pay-up percentages (percentage of subscription orders actually paid for); the conversion percentage (first-time renewals, row 26); newsstand sale per issue (row 39); the percentage of color advertising pages (row 44); the premium for color advertising (row 47); and the percentage of color editorial pages (row 53) combined with the cost of separations (getting the pictures ready for printing, line 59).

With this model—adapted to your business—you can judge the merits of going into business for yourself. Of course, should you decide to do so, then you have to get serious and convert this sheet into a detailed, month-by-month cash-flow statement that shows exactly when you'll spend money and when you'll receive it, how much you need to reach break-even, and when break-even is likely to happen.

*Stewart Alsop II is editor of* ISO WORLD.

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Quincy, MA 02169

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# USER DEFINED FORMATS IN ADVANCED VERSION VISICALC

In earlier versions of the VisiCalc® program the use of /F produced the display:

```
FORMAT: DGILR$*-
```

on the prompt line. The same options are presented when you use the /F command in Advanced Version, except that now the option

```
=
```

is also available to you. The equal sign allows you to define a format different from the ones that you have been able to use in the past. You may either redefine some familiar formats, or create entirely new ones.

When you opt for a User Defined format you are asked to name the format. The prompt line displays:

```
User Format: Name: A-Z !@#$%^&*()"'
```

Though it looks like something a cartoon character may say in anger, it means that you may define as many as 37 different formats on any worksheet, one for each letter in the alphabet (except D, which is reserved to identify Default), and one for each character in the inventory that begins with the exclamation point.

There are several general points to notice about the formatting of the sheet shown in Figure 6. First, notice that the percentage signs and parentheses, indicating a negative number, "hang" from the right of a value. That's especially noticeable in B16, B17, B133, and B135. The display of ) or % will always be in the rightmost position of a column. What the formats defined for this sheet show is the "gutter," a term borrowed from the printing industry and usually defined as the inside margin of a page or the space between two columns. We set a global one-character right-hand gutter for the sheet by using the command:

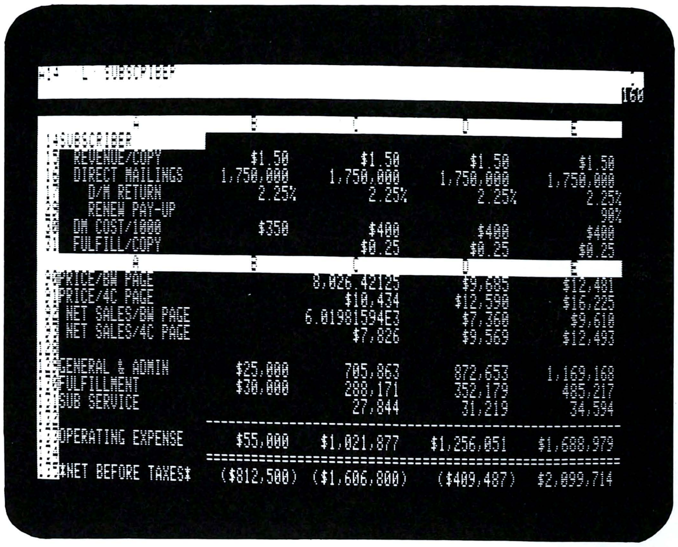
```
/GAV 1R
```

Second, notice that dollar signs are displayed in values that show two decimal places as at B15, and in other values that show an integer display as at B30.

Third, we have shown three levels of headings in column A: flush left, indented two spaces, and indented three spaces.

| Name | Attribute | Usage |
|---|---|---|
| % | V% | percentages |
| $ | V$2F | decimal dollar amounts |
| I | V,I | integer non-dollar amounts |
| B | V(,$I | integer dollar amounts |
| A | L2L | 2nd level headings |
| C | L3L | 3rd level headings |

**TABLE 1:** *All format names are preceded by /F=.*



```
            A               B            C            D            E
SUBSCRIBER
 REVENUE/COPY             $1.50        $1.50        $1.50        $1.50
 DIRECT MAILINGS      1,750,000    1,750,000    1,750,000    1,750,000
   D/M RETURN             2.25%        2.25%        2.25%        2.25%
   RENEW PAY-UP                                                    90%
 DM COST/1000              $350         $400         $400         $400
 FULFILL/COPY                          $0.25        $0.25        $0.25
            A               B            C            D            E
PRICE/BW PAGE                    8,026.42125       $9,685      $12,481
PRICE/4C PAGE                        $10,434      $12,590      $16,225
 NET SALES/BW PAGE               6.01981594E3      $7,360       $9,610
 NET SALES/4C PAGE                    $7,826       $9,569      $12,493

GENERAL & ADMIN         $25,000      705,863      872,653    1,169,168
FULFILLMENT             $30,000      288,171      352,179      485,217
SUB SERVICE                           27,844       31,219       34,594
                    ------------------------------------------------
OPERATING EXPENSE       $55,000   $1,021,877   $1,256,051   $1,688,979
                    ================================================
*NET BEFORE TAXES*   ($812,500) ($1,606,800)   ($409,487)   $2,099,714
```

**FIGURE 6.** *The screen photo shown in this Figure illustrates a number of User Defined formats. Notice that each of the two windows shown on the screen has horizontal title boundaries set.*

*Photograph by Dana Sigall*

The actual formats that we defined are shown in Table 1. The column Attributes is a part of the table because when you define a new format with /F=, you in fact set the attributes for any cell to which the format will be applied. When for example, we redefined the Integer and Dollar (I and $) formats, the contents line already showed VI and V2F for /FI and /F$. All we did to redefine them was to add a comma and dollar sign to the existing attributes. In contrast, /F=B, which is applied to a cell as /FB, is a newly defined format based on /FI but has had the parenthesis, comma and dollar sign options added.

Because User Defined formats are an application of the Attribute command, all the choices available to you when you set Attributes are also available when you define a new format. You may also choose O, which produces the prompt:

```
Original setting: Y to confirm
```

If you press Y, the format you have defined will be cancelled and all cells to which that format has been applied will display in the default condition.

When you save a sheet with /SS, the formats you have defined are saved with it. And since /CS clears only data, attribute, and title settings, once you have created a worksheet that contains format definitions that you will use frequently, you can create a transportable file of formats that you can use on other sheets. Do that by using /CS to clear the sheet, then save it with /SS after giving it a file name. When you reload it, the screen will be blank, but the file will still contain the formats you have defined. If you have also defined any Keystroke Memory sequences or printer settings (including setup strings) they would also be included in that file unless you specifically removed them.

## VISICALC RELATED PUBLICATIONS

The first criterion for including any article, book, or newsletter in this listing was whether we could find a hard copy in our library. The second was that the item appeared to be useful. We have included only articles that contain information that can work for you, either in the form of models that you can use or reviews of various products that complement the VisiCalc® program.

Whether the information, expressions, or advice in any of the items included on the list are accurate has not been verified by anyone at Software Arts, Inc. That is, we have neither reviewed nor examined any of these books, articles, or publications to determine their accuracy or freedom from error. Inclusion in this listing does not constitute an endorsement by Software Arts, Inc. of any such book, article, or publication.

### Books

David Castlewitz and Lawrence Chisausky, *VisiCalc Home and Office Companion*, Osborne/McGraw-Hill, 1982. A VisiCalc reference work and collection of example models.

Robert E. Williams and Bruce J. Taylor, *The Power of: VisiCalc*, Management Information Source, 1981. A book of exercises and examples to demonstrate the commands and capabilities of VisiCalc.

Robert E. Williams and Brian L. King, *The Power of: VisiCalc Volume II*, Management Information Source, 1982. This book is similar to *The Power of: VisiCalc*, but is based on VisiCalc V3.3.

Edouard J. Desautels, *VisiCalc for the IBM Personal Computer*, *VisiCalc for the TRS-80 Model I and Model III Computers* and *VisiCalc for the TRS-80 Model II and Model 16 Computers*, William C. Brown Company Publishers, 1982. These are guides to using VisiCalc on the various machines. There is one book for each (IBM, TRS-80 Model I and Model III, and TRS-80 Model II and Model 16). A book based on the Apple II is promised. The current books include practice problems with solutions and a variety of applications. Companion diskettes are also available for TRS-80 Model I and Model III, and for the IBM Personal Computer.

### Regular Columns

"Visulating," by Barry Bayer, *Desktop Computing*

May 1982: IRAs: analyzing the "become a millionaire" Individual Retirement Account ads with VisiCalc.

June 1982: IRRs, a long and complex column covering Internal Rates of Return and how to do them using VisiCalc.

September 1982: IRRs revisited using SATN's technique; considerations in planning and developing a VisiCalc template.

"Ventures with VisiCalc," *Softalk*

May 1981, by Frank Malone: VisiCalc uses in agriculture.

July 1981, by Craig Stinson: Updates on 16-sector VisiCalc, DIF and the other "Visi" products: VisiTrend, VisiPlot, VisiDex and VisiTerm.

September 1981, by Craig Stinson: Continuing reviews of VisiCalc related products: Context Connector and Versacalc! 16.

October 1981, by Craig Stinson: Continuing reviews of VisiCalc related products: Real Estate Templates and VU#3.

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